

ABSTRACT OF THE INVENTION

The present invention provides an isolated archael and bacterial heme binding
5 protein which reversibly binds oxygen with a low affinity. The heme binding protein
may be utilized as a blood substitute. The invention also provides a method for controlled
storage of oxygen by contacting a bacterial heme binding protein with oxygen allowing
the protein to bind and store oxygen. The also provides methods to sense gaseous ligands
using the heme binding protein. In other embodiments, the invention provides chimeric
10 proteins having a heme-binding domain of an isolated heme binding archael bacterial
protein and a heterologous signaling domain.

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